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PREDICTION OF OFFICER PERFORMANCE

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Technical Research Report 1134

PREDICTION OF OFFICER PERFORMANCE

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Officer Prediction Task.

March 1964

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PREDICTION OF OFFICER PERFORMANCE

BRIEF

Requirement:

To develop improved techniques and prerequisites for identifying officers who have aptitudes and other characteristics to meet the demands for successful performance in different types of officer command responsibility.

Procedure:

By field observation and analysis of officer MOS, the current study was centered on prediction of ability to meet the psychological requirements of three types of officer assignment--technical, administrative, and combat. The research program consists in essence of the construction of a battery of experimental tests--the Differential Officer Battery (DOB)--and the determination of the effectiveness of these tests in differentially predicting officer performance in the three areas of activity. The experimental predictors have been developed through a process of shortening and refinement, in which a preliminary battery was administered to 6500 officers and effectiveness of battery components was determined by analysis of responses of groups of officers representative of the three fields of assignment. A series of situational tests in which the officer is confronted with problems typical of service in each of three areas was developed to provide the measure of officer performance against which the tests are being validated. Analysis of the relationship between the shortened experimental battery and criterion performance test scores will be the final test of efforts to predict officer performance differentially according to type of duty assignment.

Current Status of the Research Program:

Validation of the DOB is in progress. Experimental tests comprising the battery were administered in 1961-1962 to 3500 officers entering on active duty. Current activity centers on obtaining situational performance measures of officer effectiveness for 900 of these officers--300 who have served in technical assignments, 300 in administrative, and 300 in combat.

The Officer Evaluation Center (OEC) was established at Fort McClellan as headquarters for performance evaluation of the officers constituting the validation sample. The situational tests--five technical, five administrative, and five combat--have been integrated into a continuous test exercise administered at the OEC in a simulated MAAG setting. OEC testing has progressed through shakedown operation to regularly scheduled testing of three six-man groups in each two-week period.

Job data and on-the-job ratings obtained on successive waves of DOB examinees provide the basis for continuing selection of officers to report to the Center for situational testing.

Initial statistical processing of situational test data and auxiliary criterion data--branch and job satisfaction and intention to remain in the service--has begun on a small scale. The first differential validity analysis will be undertaken in 1964-1965 when criterion cases in sufficient numbers have been processed through the Center. Further analysis will be conducted sequentially thereafter as data are accumulated on sufficient numbers of officers.

Utilization of Findings:

New personnel management tools developed through this program, together with increased understanding of the differing psychological requirements of different kinds of officer jobs, will permit greater discrimination in the assignment of officers, particularly newly commissioned ROTC graduates serving year obligated term of service. Such improvement in officer assignment should lead to heightened care satisfaction on the part of officers and, ultimately, to greater military effectiveness.

PREDICTION OF OFFICER PERFORMANCE

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PREDICTION OF OFFICER PERFORMANCE

OVERVIEW

Over the years, selection of officers has reflected considerations of generalized officer potential in terms of mental ability and personal characteristics. Progressive assignment of career officers also has to a considerable extent reflected the "generalist" concept, according to which an officer is broadly trained and capable of serving effectively in a wide range of duty assignments. More recently, accelerated progress in military technology has brought about increasing diversity and complexity in individual officer jobs. In a modern army, many officer assignments require specialized capabilities, particularly in those responsible for operation and tactical employment of the Army's modern weapons and communications systems.

These changes in the nature of the commissioned function have led to modifications in the "generalist" concept, and have raised questions about the extent to which abilities to meet the differing psychological demands of officer jobs vary with individual officers. Assuming that officers differ in their potential for responsibility in different fields of Army activity, how successfully can these differing potentials be predicted by psychological measures suitable for operational use?

Concern over these questions generated a DCSPER requirement for new personnel management tools which will provide means by which more discriminating assignment of officers can be made and which will lead to improved overall officer performance. Such tools are particularly needed to guide the initial assignment of newly commissioned second lieutenants, many of whom are ROTC graduates serving a two-year obligated tour, after which they expect to return to civilian life. Most ROTC graduates have had General Military Science training in the colleges, and their specialized training occurs only after their entry into service.

The Officer Prediction Task was established within the U. S. Army Personnel Research Office (USAPRO) to provide the Army with improved techniques and prerequisites for selecting officers who have aptitudes and other characteristics to meet the differing demands of successful performance in different kinds of assignment.

Research Approach

Research conducted prior to the inception of the Officer Prediction Task had shown considerable success in the development and use of tests to select individuals who would successfully complete officer training and perform well in military assignments. Selection programs for the

U. S. Military Academy, the Command and General Staff College, Officer Candidate School, and Reserve Officer Training Corps give evidence of the technical promise of research to identify special facets of job competence and special abilities peculiar to high level jobs and to develop from these findings valid predictors of successful performance.

In a strict sense, no two officer jobs are exactly alike. But it would be manifestly impossible to seek differential prediction of effectiveness in the 400 Military Occupational Specialties (MOS) into which the jobs fall. APRO research scientists did, in fact, select a limited number of job types for analysis to determine whether efficiency ratings could be used to demarcate job clusters which would serve as a basis for studies of differential prediction. The efficiency ratings of 10,000 officers were analyzed, but the evaluations failed to reflect difference in performance across the selected types of assignment.

After extensive examination of job descriptions for the Army's officer slots, three broad areas of duty assignment--technical, administrative, and combat--were selected as the basis for initial research planning. These three areas appeared to differ maximally in psychological requirements and to offer a basis for testing an initial minimum hypothesis as to the differential predictability of officer performance. At the same time, the three areas, while not all-inclusive of officer jobs, subsume large numbers of officer assignments.

The research requirement is, first, to determine whether ability to meet the differing psychological demands of technical, administrative and combat officer jobs is predictable, and, if so, to provide psychological instruments to assess--preferably before commissioning--the ability of individuals to meet these differing demands. In brief, the research program includes the following steps:

1. Development of psychological measures designed to be differentially predictive of performance in technical, administrative, and combat assignments, and administration of the experimental measures to an officer input sample.
2. Development of situational criterion measures reflecting actual performance in technical, administrative, and combat-type duties, and administration of these tests to officers previously tested with the experimental predictors.
3. Validity analysis of the relationships among the several predictor and criterion measures to test the minimum hypothesis that abilities to meet the differing psychological requirements of technical, administrative, and combat officer jobs are differentially predictable.
4. Identification of predictor measures which the Army can use operationally to assess the relative potential of newly commissioned officers in the three broad areas of officer assignments.

With respect to the criterion problem, several considerations led to the decision that situational performance tests, incorporating technical, administrative, and combat-type duties, should be the primary criterion of the validity of the new tests as differential predictors. A cogent reason for the decision was that measures of performance in all three job areas were needed for each examinee. On-the-job ratings could be obtained only for the job area in which the rated officer was actually serving. Additionally, the situational criterion measures based on standardized observation procedures could be based on uniform problems for all examinees.

The situational criterion had the strong endorsement of the Human Factors Subpanel of the Army Scientific Advisory Panel. The Subpanel favored the performance tests over ratings as being more compatible with the requirement for development of measures to predict competence in combat officer assignments. The situational criterion offered at least the possibility of simulating some of the stresses of wartime operations.

Criterion specifications clearly placed unusually heavy demands both on the research task for criterion construction and on the Army for administrative and logistic support. Officer Evaluation Centers--at first three were planned--were projected to serve as headquarters and field setting for the situational tests. Eventually, the requirement was reduced to a single center. The OEC at Fort McClellan (Figure 1) was activated in 1962 with the unique mission of providing criterion evaluations of performance of the officers comprising the sample in which the experimental tests are being validated.

During FY 1963, personnel of the Officer Evaluation Center were trained in administration of the situational performance tests constructed and developed through field tryout. The 15 test situations representative of combat, administrative, and technical officer jobs were integrated into a coherent sequence. Revisions and additions were made on the basis of trial administration at the center. The first sample of officers started reporting to the OEC in February 1963. Through June 1963, officers previously tested with the DOB provided cases for shakedown operation of the Center. Criterion testing began in July 1963 and is expected to continue through June 1965.

THE EXPERIMENTAL PREDICTOR BATTERY

The predictor battery currently being validated against a situational performance criterion resulted from the following research steps:

1. Initial selection of types of instrument and content areas to be included as experimental measures. Officer MOS descriptions were studied to determine the psychological requirements of various jobs and the characteristic behaviors involved. Relevant research literature originating both within and outside the U. S. Army was surveyed to formulate rationales for the experimental predictor content. Since



Figure 1. Headquarters building of the Officer Evaluation
previously tested with the experimental Differ



1. McClellan where situational tests are administered to officers
Battery

personnel about to be commissioned have already been screened on general mental ability and generalized leadership potential, noncognitive types of predictor material were given preference.

2. Test construction, including development of test items and problems and firming up of content through reviews and informal tryout.

3. Selection of battery content and shortening of component tests by analysis of results in a large sample of officers.

Samples in which battery content was evaluated were selected from approximately 6500 officers to whom the battery in original three-day form was administered during 1958-1959. Had an Officer Evaluation Center been operational by 1959 as originally planned, the experimental battery would have been validated against the situational performance criterion. However, when the establishment of the OEC was delayed, decision was made to obtain special on-the-job ratings of the officers in the sample and to use these ratings as a yardstick against which to make a preliminary evaluation of battery components and item content of the instruments. Results were used as a basis for eliminating the less effective portions of the battery. (Details of the data processing and analysis are presented in Section I of the technical supplement.)

By July 1961, the entire predictor battery, shortened and printed as the Differential Officer Battery (DOB), was ready for administration to a new sample of officers entering active duty, and for validation against situational criteria administered at an Officer Evaluation Center. The shortened DOB requires two days for the paper-and-pencil tests, plus about one hour for the Physical Skills and Stamina Tests, and another hour for the Officer Potential Ratings which are obtained in the seventh week of the Officer Orientation Course instruction at each branch school.

Content of Battery

Six types of predictor have been retained in the battery now undergoing validation (Figure 2):

1. Biographical and Self-Description Instruments. The three instruments included measure background, personality characteristics, attitudes, and expressed interests.

2. Information Tests. Explicitly, these instruments test information in various subject-matter areas. The hypothesis is that information gained, particularly without formal training in a subject, reflects interest in that area. Information items have proved differentially predictive in the enlisted domain and in other research both in and out of the Army. Both information specific to military tactics, logistics, and finance, and general information--chiefly nonmilitary--are included.

<u>INSTRUMENT</u>	<u>PT NO.</u>	<u>ITEMS</u>	<u>TIME</u>
<u>Biographical or Self-Description</u>			
Personal Data Record (PDR)	3397	55	30min
Differential Inventory, Bklt A (DI-A)	4152	212	1h 00min
Differential Inventory, Bklt B (DI-B)	4153	330	1h 30min
<u>Information</u>			
Information Test, Bklt A (IT-A)	4148	150	1h 15min
Information Test, Bklt B (IT-B)	4149	150	1h 15min
Information Test, Bklt C (IT-C)	4150	150	1h 15min
Information Test, Bklt D (IT-D)	4151	150	1h 15min
<u>Social Perception</u>			
Group Awareness Test (GAT)	4093	75	1h 00min
Individual Understanding Test (IUT)	4092	75x3	1h 30min
<u>Command Judgment</u>			
Speeded Practical Judgment Test (SPJ)	3395	40	1h 30min
<u>Physical Skills and Stamina (PSS)</u>	4079		1h 00min
Two-Hand Coordination Test	(DA 6124)	-	-
Kneeling Basketball Throw	-	-	-
Endurance Crawl	-	-	-
<u>Officer Potential Ratings</u> <u>(Peer Evaluations)</u>	3381 (Rev)		1h 00min
Job A, Administrative Leadership	3378	-	-
Job B, Tactical and Troop Leadership	3379	-	-
Job C, Technical Leadership	3380	-	-

Figure 2. The Differential Officer Battery as administered to officer input, June 1961-February 1963

3. Social Perception Tests. This set of tests is designed to measure ability to estimate opinions of others in a group (empathy) or to perceive similarity or differences in the views and attitudes of individuals (assumed similarity). Studies have shown that social perception of this type is related to leadership and tangentially to group effectiveness.

4. Command Judgment. The Speeded Practical Judgment Test uses a moving picture film dramatizing command problems to measure the ability to make sound leadership decisions in situations involving subordinates. Speed and soundness of judgment have been found to be related to leadership in a variety of situations.

5. Tests of Physical Skills and Stamina. Measures of physical proficiency have been found to predict leadership ratings of USMA cadets and later efficiency ratings and Korean combat performance of USMA graduates, as well as performance of enlisted men in Arctic maneuvers.

6. Peer Evaluations. Early ratings by associates have been found to predict later leadership behavior in a variety of situations including combat. To evaluate peer ratings for differential prediction, the ratings were obtained after the officers had had seven weeks of association during initial branch training.

THE SITUATIONAL CRITERION TESTS

The framework for the officer testing is a simulated Military Assistance Advisory Group (MAAG) Headquarters. The MAAG setting appeared to provide a reasonable vehicle for introduction of a variety of duty assignments. None of the tested lieutenants will have had specific MAAG experience; thus the environment is equally unfamiliar to all. The lieutenants to be given the situational criterion tests are informed that they are reporting for duty at a United States Army MAAG Headquarters located on the outskirts of the capital city of a friendly host nation. While awaiting reassignment to a field unit, they are told they will be called upon to perform a number of different assignments. The narrative provides for a succession of technical and administrative assignments, followed by appropriate combat activity.

The basic purpose of the situational tests is to provide measures of performance in duties representing the technical, administrative, and combat job areas--measures which will permit differential validation of the predictors in those areas as a test of the minimum hypothesis. Tasks were selected to provide reliable coverage of each area, but the whole spectrum of activities in each area was not necessarily represented.

Under this concept, each job sample is a mission or specific assignment which in its totality is representative primarily of one of the three areas. These representative missions, or job samples, are integrated into a single exercise bound together in a realistic sequence.

Situational Test Requirements

Certain research requirements provided joint and continuing guidance throughout the development of the situational measures:

1. Since all criterion examinees, regardless of background, would be measured in all tasks, it was necessary that all tasks be susceptible of performance without specialized experience and training. Officers having the specialized experience and training relevant to a particular task would, of course, be at some advantage; but the briefings, references, and other resources made available for each task would permit all officers to undertake each particular problem.
2. Within each area (technical, administrative, combat) the tasks chosen should involve military activities which qualified military consultants recognize as military requirements representative of a given area. For purposes of the experiment, and particularly in view of the extreme economy required in support personnel, an officer being examined might be called upon at times to perform tasks which an officer would normally have someone perform for him, but the task itself should be a reasonable military requirement.
3. The military activities called for in the various tasks should involve psychological behaviors or military end-products which are militarily meaningful and characteristic of good or poor officer performance in the given setting. That is, performance should be recognizable by qualified military consultants as acceptable or unacceptable, capable of being observed, and capable of being objectively recorded or qualitatively evaluated.

The Scenarios for the Individual Tests

In preparing tests for each area, the first step was to consult the appropriate sources--officers who were experts in their particular field, as well as relevant publications. An overall outline of intended test coverage of each area was then sketched out. Short statements of potential job-sample tests were formulated and then expanded into two-page test summaries. The test summaries were reviewed by subject-matter experts, and the more promising were selected and revised for further development. For each summary so selected, the military-psychological factors to be measured were identified. In consultation with subject-matter experts, the selected test summaries were expanded into draft scenarios of test action.

Completing the Scenarios in the Field

The draft scenarios were subjected to tryout administration, during which further development and revisions were accomplished. This phase was completed by the middle of 1959. During the next two years, the

scenario for each test was incorporated into a full manual which included complete background, facilities, personnel and time requirements, instructions for administration, and all scoring documents needed to administer the tests either as a single problem or as part of an integrated series of problems.

Each situational test was then taken to the appropriate branch school (Figure 3) for technical review by subject-matter experts of the school faculty, and dry-run administration. Further revisions were made as necessary, and the revised manuals were reprinted for use in the situational criterion testing. Final refinements in each test were worked out during initial implementation of the Differential Officer Performance Battery (DOPB) at the U. S. Army Officer Evaluation Center.

<u>TECHNICAL AND ADMINISTRATIVE TESTS</u>	
U. S. Army Engineer School	Fort Belvoir, Virginia
U. S. Army Ordnance School	Aberdeen Proving Ground, Maryland
U. S. Army Quartermaster School	Fort Lee, Virginia
U. S. Army Signal School	Fort Monmouth, New Jersey
U. S. Army Transportation School	Fort Eustis, Virginia
The Adjutant General's School, U. S. Army	Fort Benjamin Harrison, Indiana
<u>COMBAT TESTS</u>	
U. S. Army Infantry School	Fort Benning, Georgia

Figure 3. Army service schools participating in development of situational criterion performance tests

THE OFFICER EVALUATION CENTER

The Officer Evaluation Center (OEC) was established as a class II activity of The Adjutant General (TAG) 1 March 1962, with station at Fort McClellan, Alabama^{1/}. When the Army reorganization resulted in the activation of the Office of Personnel Operations (OPO) 1 July 1962, the OEC was made a class II activity of OPO^{2/}. Within OPO, the OEC became a responsibility of the Executive for Career Planning, Officer Personnel Directorate. The table of distribution provides for 17 officers and 41 enlisted men.

In May 1962, the first of the commissioned staff were on duty at Fort McClellan to take up the work of funding, manning, and equipping the center, refining cost estimates, and arranging for building modifications and logistical support from Fort McClellan. The commanding officer and the first of his commissioned staff to become available were briefed at the U. S. Army Personnel Research Office (USAPRO) in Washington before proceeding to Fort McClellan. The briefings covered the officer prediction research in general, basic concepts of psychological measurement, and plans for the OEC to administer the situational criterion exercise. USAPRO personnel then accompanied the OEC officers to Fort McClellan to orient OEC personnel in the administration of the situational tests of the Differential Officer Performance Battery. At the end of 1962, an AFRO research psychologist was recruited specifically to be the Officer Prediction Task psychologist in residence at the OEC.

The AFRO research psychologists who had "authored" the tests provided the OEC commissioned staff with detailed orientation on the administration and recording of each test (Figure 4). Officers in charge of testing teams then gave detailed instructions to their enlisted team members, with the test authors present for continuing guidance. During this phase of the testing process, examinee roles were played by OEC staff members. Examiner roles were rotated to provide cross training. At first, each situational test was conducted separately, testing a single examinee. Gradually, integration of the tests into a MAAG narrative was undertaken, and two or three examinees were tested simultaneously. By the end of September 1962, related tests were being administered to six examinees simultaneously--the intended pattern of Center operation. Near the end of 1962, a total of 12 tests was first administered in sequence in an integrated MAAG narrative. Lieutenants made available by Fort McClellan activities were introduced as trial examinees--first singly and finally in pilot groups of six examinees at a time. The OEC was now ready to begin shakedown operation--evaluating the first groups of lieutenants previously tested with the Differential Officer Battery of experimental predictor tests (Figures 5, 6, 7).

^{1/} DA General Orders No. 10, dated 26 February 1962.

^{2/} DA General Orders No. 35, dated 19 June 1962.



Figure 4. Colonel John H. Dixon, Infantry, Commanding Officer
APRO staff



cer Evaluation Center, going over test procedures with OEC and

- 12 -



Figure 5. Officer examinee at the Officer Evaluation Cent
Commanding Officer has assigned to him



o his enlisted subordinates the combat mission which the

- 13 -



Figure 6. Field bunker used by officer examinees in situ



Performance test exercise at the Officer Evaluation Center



Figure 7. Officers and NCO's of the Officer Evalua



staff in one of the field bunkers

While this team training was in progress, Officer Prediction Task psychologists (the test authors)--in consultation with the various testing officers and the OEC commander and his operations staff--were taking advantage of the experience of actual conduct of the tests to introduce modifications and refinements in test content, in the scoring, and in the MAAG narrative.

OEC Shakedown Operation

The first group of six lieutenants previously tested with the DOB performed the OEC exercise in February 1963. Scheduling is in two-week cycles, with two groups entering one week and one group the next. The selected lieutenants reach the OEC after 18 months of active duty. They are selected, to the maximum extent possible, so that each six-man group includes two with technical background, two with administrative background, and two with a background of combat assignment.

Shakedown operation of the OEC, with lieutenants as examinees, occupied the first half of 1963. During this period also, as a result of the determination that there was insufficient technical coverage in the Differential Performance Battery, three new technical measures were developed, tried out, and introduced into the total MAAG exercise. Finally, in order to obtain auxiliary criterion information (branch and job satisfaction and strength of career intention), the Officer Assignment Questionnaire was introduced for administration to each lieutenant upon arrival at the OEC. Except for the completely new technical tests, most data collected during this period could be regarded as validation data. By July 1963, all measures were in final form and testing with the complete DOFB commenced for the record.

THE VALIDATION SAMPLE

The overall scheme for validation of the Differential Officer Battery, using a second sample of officers entering active duty, is essentially that originally intended for the 1958-1959 sample. Officers entering active duty were given the predictor battery at their branch schools before beginning their Officer Orientation Course. From June 1961 through February 1963, the shortened DOB was administered to nearly 3500 selected officers entering active duty in nine branches (Figure 8). Officers tested at the branch schools were for the most part those having CONUS assignment, preferably in the Southeastern part of the United States, in order to minimize travel distance to the OEC. However, exclusion of all overseas assignees was not possible in the case of Ordnance Corps and Quartermaster Corps officers. The August 1962 orientation classes of Regular Army officers, both U. S. Military Academy graduates and ROTC Distinguished Military Graduates, were included in the testing. After about 18 months of active duty, officers selected primarily on the basis of duty assignment are assigned to the OEC to go through the situational performance exercise.

<u>Branch School</u>	<u>No. of Examinees</u>
Infantry (Benning)	398
Armor (Knox)	371
Artillery (Sill and Bliss)	396
Engineer (Belvoir)	277
Signal (Monmouth and Gordon)	208
Ordnance (Aberdeen) ^a	991
Quartermaster (Lee) ^a	526
Adjutant General (Benjamin Harrison)	185
Finance (Benjamin Harrison)	<u>111</u>
TOTAL	3463

^aSome overseas assignees tested in Ordnance and Quartermaster Corps

Figure 3. Selected newly commissioned officers tested with Differential Officer Battery June 1961--February 1963

As with the earlier sample of predictor examinees, punched-card decks obtained on a regular basis from The Adjutant General's Office show current organizational address of all lieutenants who took the DOB during 1961 and 1962. Beginning in the latter part of 1962, inquiries have been mailed to field organizations of successive waves of DOB examinees. The organizations are asked to provide descriptions of the job duties of the officers in question and ratings of their duty performance. Performance ratings obtained from each officer's immediate supervisor, an additional superior, and two close associates will permit comparison of rating criteria of this kind with the situational criterion obtained at the OEC. Duty descriptions obtained from all raters and from the officer himself provide the basis for selection of officers to go to Fort McClellan to receive situational criterion measurement and also for determination of ratee samples for analysis. Thus, the rating criterion is obtained on all DOB examinees whether or not they are selected for OEC evaluation.

A criterion evaluation sample of 900--300 each with technical, administrative, and combat command background--is considered minimal. Because the input rate of examinee lieutenants to the OEC is lower than anticipated (420 rather than 600 per year), and because of delay in beginning OEC operation, the existing examinee pool of two-year reservists

will leave active duty before the necessary number can receive situational criterion measurement. In order to provide the requisite pool for criterion measurement at the Center during the first half of 1965, additional officers entering active duty during 1964 will be given the DOB. Current plans call for the Officer Evaluation Center to operate through June 1965. Throughout this period, job-duty information and performance ratings will be obtained by mail on successive waves of DOB examinees, and selection of DOB tested officers to receive orders to the Center will continue.

CURRENT STATUS OF THE PROGRAM

To summarize, in the first quarter of calendar year 1964, progress of Officer Prediction research stands as follows:

1. The Differential Officer Battery of experimental tests has been developed through successive--and sometimes repeated--stages of planning, construction, a priori refinement, experimental administration to 6500 officers, analysis of content against the criterion of rated officer performance, selection of content based on results of the analysis, and organization into appropriate form for administration, together with the necessary auxiliary testing materials.

2. The experimental Differential Officer Battery, in revised and shortened form, has been administered to a second sample of 3500 incoming officers from which samples of officers performing primarily in technical, administrative, and combat assignments are selected. In the selected sample, predictor scores will be analyzed in relation to situational performance criteria to determine the differential predictability of technical, administrative, and combat officer performance. Additional testing of incoming officers is scheduled as a means of insuring a sufficient number of DOB tested officers with a year or more of experience to complete the criterion sample. Duty descriptions and job performance ratings are obtained on the DOB examinee sample. The job description information serves as a basis for selecting officers for the situational criterion sample.

3. Situational tests to constitute the Differential Officer Performance Battery have been devised to measure officer performance in representative situations occurring or expected to occur in officer jobs. Through repeated review, tryout, and field testing, the test situations have been forged into the present officer performance exercise, consisting of five technical situations, five administrative situations, and five combat situations.

4. The Officer Evaluation Center has been established at Fort McClellan, Alabama for the purpose of administering the situational criterion tests to officers in the differential validation sample. During the early months of the Center's existence, activity focused on integrating the situational performance tests into a continuous exercise

taking place in a simulated MAAG setting. Shakedown runs have been completed in which the entire evaluation exercise was administered to groups of officers previously tested with the DOB.

5. Officers of the "for the record" validation sample are now being tested, three six-man groups in each two-week period. Ongoing procedures continue for obtaining job-duty information and performance ratings by mail on successive waves of DOB examinees from whom officers are selected to go through the situational test exercise at the Center.

6. Statistical processing of situational test data and auxiliary criterion data has been initiated.

7. Preparatory to differential validity analysis of predictors, considerable statistical processing and analysis of the data need to be accomplished. Analysis of predictors in the initial rated officer sample (1958-1959) was directed toward identifying the more valid content of the predictors assembled for tryout. Further analysis of these data has been undertaken to organize officer responses into scores which will be psychologically meaningful for officer career orientation. Specifically, subscores, or keys, for the self-description and interest questionnaires representing recognized psychological dimensions have to be developed on the basis of results with the 1961-1962 sample. Job-oriented keys derived empirically on the 1958-1959 sample are already available.

Coordination is in progress for collection of data used operationally in ROTC selection and branch and duty assignment of the two-year reservists who took the DOB. This information consists primarily of records obtained from ROTC sources, and includes the score obtained by each officer on the ROTC Qualifying Examination (RQ), his college major and grade-point average in his college courses, his stated preference for branch assignment, and similar background information. In addition, undergraduate data and branch preferences are obtained for the Regular Army officers in the sample, including both U. S. Military Academy graduates and Distinguished Military Graduates of the ROTC program.

PROJECTED VALIDITY ANALYSIS

The technical, administrative, and combat-type performance scores achieved by 900 lieutenants at the Officer Evaluation Center constitute the principal criterion for testing the "minimum hypothesis" of this research--namely, that abilities to meet the differing psychological requirements of technical, administrative, and combat-type officer jobs are differentially predictable.

For all 900 officers selected, there will be situational criterion scores in technical, administrative, and combat-type performance, plus auxiliary criterion measures of branch and job satisfaction and strength of career intention. In addition, information on whether the officer elected to remain in service--or was retained--will become available for the two-year reserve officers in the total sample as their terms of obligated service expire.

The first differential validity analysis will be undertaken in 1964-1965 based on criterion cases processed by a cut-off date (to be established). Further validity analysis will be conducted sequentially thereafter as data are collected on sufficient numbers of officers. The validity analysis will follow two main currents. The primary test of the differential predictability of performance in three major types of officer assignment will center in the OEC sample of 900 officers. The primary questions to be answered by this analysis will be:

1. Does the experimental measure or set of measures developed (in the 1958-1959 sample) to predict successful performance in a given job area have higher validity for that area than for other areas?
2. Does it have higher validity for that area than do measures developed to predict success in other areas?

Affirmative answers will indicate that differential prediction is occurring. Relative success of the experimental predictors will constitute a basis for selection and refinement of measures for operational use. This objective will be pursued through analysis of lesser components of predictor scores--even officer responses to individual items in the tests, if necessary--against the situational performance criteria.

There is a further question--and one vital to the contribution of the research to officer career management: Does the experimental predictor improve on the selectors now in operational use, or, if used in combination with the operational selectors, does it add to the effectiveness of selection procedures? An affirmative answer to this question will indicate a potential gain to the Army over the personnel management tools now available.

Also in the OEC sample, the validity of the predictors will be examined against auxiliary criterion measures of branch and job satisfaction and strength of career intention to determine whether means exist for placing newly commissioned officers in branch and job assignments which will enhance their feelings of satisfaction and their disposition to become career officers. Finally, the inter-relationships of the situational criterion scores, the auxiliary criteria, and job performance ratings obtained by mail will be examined.

In the larger group for whom ratings are obtained by mail, the three types of predictor (operational data, job-oriented DOB subscores, and subject-matter DOB subscores) will be validated by a similar differential analysis. The sample will be broken down into subgroups matching those analyzed in the 1958-1959 examinee sample. Since these subsamples represent a more refined breakout of officer jobs than do the three broad categories of OEC examinees, favorable outcome of analysis in these groups may permit the selection of predictor content for operational use over a fairly wide range of officer job types.

PROJECTED IMPLEMENTATION OF DCSPER MEASURES FOR OPERATIONAL USE

The action agency for executing DCSPER personnel policy is the Office of Personnel Operations (OPO). Implementation of officer career policies is under direction of the Executive for Career Planning, Officer Personnel Directorate, who also has command responsibility for the OEC. As expressed by the Executive for Career Planning, the most immediate interest is in personnel management tools applicable to ROTC graduates in General Military Science, who serve a two-year obligated tour. Psychological measures would be appropriately administered before the senior year of college--probably during ROTC summer camp, when peer or other evaluations are currently obtained for later consideration in career orientation. Scores would then be available to personnel action agencies for duty assignment of all ROTC men serving the two-year obligated tour and for guidance in branch assignment of the General Military Science students. Scores would also be helpful in guiding initial assignment of Distinguished Military Graduates of ROTC commissioned as RA officers. Scores on differentially predictive measures could also be made available to the ROTC student for purposes of self-analysis and guidance in deciding on his branch preference.

For other incoming officers, profiles of differential scores would be useful in identifying those most likely to succeed in specialized areas of assignment, as well as those matching the generalist concept of "all-round" competence.

Improvement in officer utilization through successful differential prediction should lead to improved military effectiveness, officer morale, branch and job satisfaction, career attractiveness, and retention rate. Through analysis of the several predictor-criterion relationships, there should also be an increased understanding of the differing psychological requirements of different kinds of officer jobs.

DEVELOPMENT OF PREDICTOR AND CRITERION MEASURES AND PROJECTED
STATISTICAL ANALYSIS

TECHNICAL SUPPLEMENT

TECHNICAL SUPPLEMENT

SECTION I. DEVELOPMENT OF THE DIFFERENTIAL OFFICER BATTERY (DOB)

CONTENT OF INITIAL BATTERY

From October 1955, when officer prediction research began, to July 1957, attention centered on development of the experimental predictor battery. The initial set of experimental measures, termed the Differential Officer Leadership Battery (DOL), was designed to reflect both officer characteristics which differ in importance in different officer job areas, and officer characteristics associated with officer job success in general.

Self-Description Instruments

Personal Data Record (PT 3397). The instrument contains 55 items, 30 reflecting socio-economic status and 25 reflecting preferences for school subjects and school achievement.

Combat Self-Description Blank, COMBIB-1 (PT 3203). The instrument contains 250 items of varied format measuring aggressiveness, individualism, emotional and social spontaneity, and various work interests. Content was selected on the basis of previous research to identify effective combat leaders.

Officer Leader Self-Description Blank, DOLBIB-1 (PT 3331). This self-description blank contains 480 yes-no and 2-choice items reflecting leadership, Army adjustment, suitability for, and interest in, technical, administrative, or combat-type jobs, and specific interests in ten job areas previously delineated for the officer MOS analysis (referred to on page 2).

Information Tests

Explicitly, these instruments test the individual's information in various subject-matter areas, on the hypothesis that information reflects interest in those areas.

Tactics Test, TI-1 (PT 3221). The booklet contains 115 items on combat tactics.

Logistics Test (Technical), LOG(T)-1 (PT 3220). The booklet contains 107 items on Technical Services hardware (or civilian materiel closely related thereto).

Logistics Test (Supply), LOG(S)-1 (PT 3219). The booklet contains 120 items on supply and warehousing.

Financial Management Test, FM-1 (PT 3222). The booklet contains 122 items on market transactions, accounting and auditing, and business practice.

General Information Test, GIT, Booklets A through F (PT 3276 through 3281). The booklets contain, in all, 644 items covering world affairs, mechanics, outdoor activities, science, sports, aesthetics, mathematics, recreation, social welfare, and miscellaneous areas.

Social Perception Tests

Group Awareness Test, Form A (PT 3400) and Form B (PT 3401). This test is an empathy measure, in which the examinee uses a 5-step scale to estimate the percentages of NCO's, enlisted recruits, and newly commissioned ROTC officers agreeing with each statement. Each form consists of 11 statements. The forms, presented as the General Opinion Survey, were administered to approximately 400 NCO's, 400 enlisted recruits, and 400 newly commissioned ROTC officers, and the percentage of each group actually agreeing with each statement was determined. For each item, the examinee's score is the number of scale steps his answer departs from the correct answer determined by actual percentages in the normative groups.

Individual Understanding Test, Form A (PT 3403) and Form B (PT 3404). This test is an assumed similarity measure. The examinee uses a 5-step scale to report his own agreement or disagreement with each statement. On a second answer sheet, he uses the same scale to estimate the responses of the "most promising" future officer (not identified) in his ROTC class. On a third answer sheet, he estimates the responses of the "least promising" future officer. For each item, the examinee receives three scores: (1) the number of scale steps separating his own response from that which he estimated for the "most promising" officer, (2) the number of steps separating his own response from that which he estimated for the "least promising" officer, and (3) the number of scale steps separating his estimated response for the "most" and "least" promising officers.

Test of Command Judgment

The DOL Battery contains one test designed to measure the examinee's ability to make sound leadership decisions in situations involving subordinates.

Speeded Practical Judgment Test (PT 3395). A movie film adapted from training materials developed by the Human Resources Research Office,

dramatizes ten problem situations--there is an initial practice situation. When the dramatized sequence reaches the point requiring the commander's decision, the dramatic action stops and four possible solutions are presented on the sound track. The examinee uses a 4-step scale to evaluate each solution independently, under conditions of closely limited time.

Tests of Physical Skills and Stamina

The manual for the original set of Tests of Physical Skills and Stamina (PSS-2) (PT 3410) provided for six measures:

1. 150-yard Shuttle Run
2. Kneeling Basketball Throw
3. Vertical Jump
4. Pull-ups
5. 40-yard Endurance Crawl
6. Two-hand Coordination Test (DA PRT 2617). This test requires rapid striking of styli into irregularly arranged half-inch circles, alternating single strikes between left hand and right hand.

Peer Evaluations

The DOL Battery includes peer ratings as experimental differential predictors, evaluations being obtained after seven weeks of association during initial branch training. A booklet, Directions for Accomplishing the Officer Performance Rating Scale (PT 3381), provides a 5-step scale for evaluating associates on three separate forms:

Job A, Administrative Leadership (PT 3378)

Job B, Tactical and Troop Leadership (PT 3379)

Job C, Technical Leadership (PT 3380)

REFINEMENT AND SHORTENING OF THE BATTERY

The initial battery required three days for administration of the paper-and-pencil tests and an additional half day for administering the physical proficiency test and gathering other information. In this form, the battery was administered to an input officer sample of 6500 on whom job rating criteria accomplished specifically for officer prediction research were later obtained. Administration to the incoming officers was originally intended to provide the sample in which the differential

validity of the instruments would be tested against officer performance on the situational tests. All officers, RA and non-RA, graduates of the U. S. Military Academy, and Distinguished Military Graduates of ROTC, entering active duty through eleven branch schools from January 1958 through June 1959 constituted the sample (Table 1). According to the intended schedule, one or more Officer Evaluation Centers, each manned by some 50 or more military personnel, would be established to begin situational testing in July 1959. Somewhat in advance of that date, it became clear that no such facilities could be made available. In order to use to best advantage the data already collected, APRO quickly formulated plans to obtain special on-the-job criterion ratings of as many as possible of the 6500 examinees to provide an external yardstick as a basis for shortening the predictor battery. The Human Factors Sub-panel of the Army Scientific Advisory Panel reluctantly indorsed the proposal while still urging that the validation ultimately include the situational performance criteria.

Table 1

NEWLY COMMISSIONED OFFICERS TESTED
WITH DIFFERENTIAL OFFICER LEADERSHIP BATTERY,
JANUARY 1958 to JULY 1959, BY BRANCH SCHOOL

<u>Branch School</u>	<u>No. of Examinees</u>
Infantry (Benning)	1,311
Armor (Knox)	579
Artillery (Sill and Bliss)	1,862
Engineer (Belvoir)	407
Signal (Monmouth)	642
Ordnance (Aberdeen)	561
Transportation Corps (Eustis)	443
Quartermaster (Lee)	371
Adjutant General (Benjamin Harrison)	240
Finance (Benjamin Harrison)	86
TOTAL	6,502

Analysis of battery content was performed in two phases: an internal analysis of information test items, both general and in specific military job areas, on the basis of responses of 550 officers examined early in the predictor data collection period; and a validity study of test content against on-job ratings in samples taken from the total group of 6500 officers. Through these analyses, the battery was pared to the point where only two days and two hours were required for predictor data collection.

Preliminary Analysis of Information Test Content

On the basis of the responses of the 550 officers, analysis of the information test items was performed in order to cluster the items and provide subscores representative of the subject-matter areas included in the 644 items of the General Information Test and in the specific military subject-matter tests.

For the specific information tests--Tactics, Logistics (Technical), Logistics (Supply), and Financial Management--each item in a given test was biserially correlated with total score on each of the four tests and also with total score on the 644 general information items. For an item to be selected for the refined subscore in a test, the biserial coefficient of correlation with the test in which the item occurred was required to be of suitable magnitude and also to exceed its biserial coefficient correlation with any of the other three tests involved. Results are shown in Table 2.

Table 2

EFFECT OF SHORTENING THE FOUR SPECIFIC INFORMATION TESTS BY INTERNAL CONSISTENCY ANALYSIS

Name of Test	Number of Items	
	Original Test	Items selected in preliminary analysis
Tactics	115	61
Logistics (Technical)	107	63
Logistics (Supply)	120	50
Financial Management	122	37
TOTAL	464	261

Similar analysis of all general information test items was conducted by correlating each of the 644 items with each of the originally assigned subscores including the subscore in which the item occurred. Subsequently, the clusters were twice revised on a basis of review, so that the final set of subscores were not derived with complete dependence on the statistics. The effect of these steps for the general information items is shown in table 3.

Table 3

EFFECT OF SHORTENING 15 GENERAL INFORMATION SUBTESTS
BY INTERNAL CONSISTENCY ANALYSIS

Subject Matter Area	Number of Items	
	Original Test	Items selected in preliminary analysis
Organized Sports	46	4
Nature Sports	22	4
Farm Facts	34	23
Biology and Medicine	31	2
Psychology and Psychiatry	10	10
Mechanical Information	50	39
Physics	27	21
Chemistry	26	22
History and Philosophy of Science	30	18
Mathematics	52	36
Games	22	15
Art	26	17
Music	26	15
Entertainment	21	18
Literature	47	26
World Affairs and Politics	57	31
Socio-Economic Facts	38	19
Quantitative Miscellany	21	8
Non-Quantitative Miscellany	44	13
TOTAL	644	401

The Rating Criterion

Special instruments were devised for the rating criterion, including a special scale of officer performance (Figure 9). Beginning early in 1960, about 18 months after predictor testing, duty performance ratings were obtained by mail from each officer's immediate supervisor, an additional superior, and two close associates. The officer and all his raters were asked to describe the ratee's actual duties to provide a basis for determination of analysis samples. Table 4 shows rater intercorrelation coefficients for all hard-core technical, administrative, and combat command cases with four raters. On the basis of this inter-rater agreement, it was estimated that the reliability coefficient of a four-rater average was approximately .73, of a three-rater average approximately .67. At least three ratings were required for a case to be included in the samples.

Since promotion to first lieutenant normally occurs upon completion of 18 months of duty as a second lieutenant, the relationship between criterion score and months of active duty was examined, separately for first and second lieutenants, for all hard-core technical, administrative, and combat officers for whom months of active duty information was available. The results shown in Table 5 indicate independence of criterion scores from length of active duty in the case of first lieutenants; but for the smaller number of second lieutenants (averaging over 18 months of active duty) criterion scores were found to average lower and to correlate negatively with number of months of service.

The Analysis Subsamples

From descriptions of the duties the officers were performing, subsamples consisting of technical, administrative, and combat examinees were constituted, based on strictly circumscribed concepts of the duties included in each area of assignment. The hard-core technical sample was limited to officers with assignments as technical experts directing the installation, operation, maintenance, and repair of materiel or hardware equipment, either electronic or mechanical and electric. Hard-core administrative cases were officers assigned to nonmateriel support management, including general administration, staff coordination, and supervision of personnel, finance, and records activities. The hard-core combat sample consisted of officers in command of tactical troops using infantry or armor weapons, including command of trainees in Basic Combat Training, and Advanced Individual Training. Five additional samples were formed to represent officer assignment in artillery command, combat staff, logistics (supply), logistics (technical), and logistics (general). The artillery command and combat staff groups were considered as supplementary combat samples; the logistics (supply) and logistics (general) as supplementary administrative samples; and the logistics (technical) as a supplementary technical sample. Sample sizes and descriptive criterion data for all hard-core and supplementary samples are shown in Table 6.

OFFICER PERFORMANCE SCALE

WHAT IS YOUR OVER-ALL JUDGMENT
OF THE RATED OFFICER'S PERFORMANCE OF THIS DUTY?

- | | |
|---|---|
| 7 | The <u>VERY BEST TYPE OF OFFICER PERFORMANCE</u> --an inspiring example to all. I trust him completely, in this assignment, to know what is to be done and to see that it is done, in any circumstance. His performance of this duty is <u>far above the requirements</u> of his situation, suggesting the <u>highest kind of formal recognition</u> through meritorious award, decoration, or accelerated advancement in grade. This type of officer is ideal for important duty in this kind of assignment. |
| 6 | An <u>EXTREMELY HIGH TYPE OF OFFICER PERFORMANCE</u> . He pulls a great deal more than his own weight in this assignment. His performance of this duty is <u>markedly above the requirements</u> of his situation, suggesting <u>formal recognition</u> through off-schedule preparation of a special (favorable) efficiency report, or through letter of commendation or of appreciation. |
| 5 | <u>VERY GOOD OFFICER PERFORMANCE</u> . He has more than enough of what it takes to succeed in this assignment. His performance of this duty is <u>somewhat above the requirements</u> of his situation, suggesting <u>informal recognition</u> through specific favorable comment (for example, in his regular efficiency report), and through informal appreciation or commendation. |
| 4 | <u>GOOD OFFICER PERFORMANCE</u> --the backbone of the officer corps. He has what it takes to succeed in this assignment. His performance of this duty is <u>fully up to the requirements</u> of his situation, suggesting <u>general appreciation</u> (perhaps mostly unexpressed). |
| 3 | <u>NOT-SO-GOOD OFFICER PERFORMANCE</u> . He doesn't quite have what it takes to succeed in this assignment, without special help. His performance of this duty is <u>somewhat below the requirements</u> of his situation, though suggesting only the <u>mildest kind of corrective action</u> through informal recommendations for improvement provided by proper supervision, or through change of duty assignment within the organization. |
| 2 | <u>PRETTY POOR OFFICER PERFORMANCE</u> . He has very little of what it takes to succeed in this assignment. His performance of this duty is <u>markedly below the requirements</u> of his situation, suggesting <u>formal corrective action</u> through off-schedule preparation of a special (unfavorable) efficiency report, through administrative admonition, letter of reprimand, or summary court, or through transfer out of the organization. |
| 1 | The <u>WORST TYPE OF OFFICER PERFORMANCE</u> --a total threat to the mission. Either he doesn't know his job, or he can not or will not perform it as required. His performance of this duty is <u>far below the requirements</u> of his situation, suggesting the <u>most drastic kind of formal corrective action</u> through reclassification, demotion, general court, or boarding out of the Army. |

Figure 7 Officer performance scale on which criterion ratings were obtained for analysis of content of preliminary predictor battery

Table 4

INTERCORRELATION COEFFICIENTS AMONG RATINGS, BY TYPE OF RATER
AND AVERAGE RATING BY FOUR RATERS, IN HARD-CORE JOB SAMPLES
(N = 657)

Rater	Other Sup	First Assoc	Second Assoc	Avg. of Four
Immediate Superior	.47	.41	.34	.75 ^a
Other Superior		.39	.37	.75 ^a
First Associate			.39	.74 ^a
Second Associate				.71 ^a

^aPart-whole relationship.

Table 5

MEANS, STANDARD DEVIATIONS, AND CORRELATION COEFFICIENTS
OF CRITERION SCORES AND MONTHS ON ACTIVE DUTY, BY
GRADE, IN HARD-CORE JOB SAMPLES

Grade	Criterion			Months on Duty		
	N	Mean	S.D.	Mean	S.D.	r
1st Lts	785	5.22	0.60	20.9	2.0	-.31
2d Lts	163	4.31	0.20	20.2	3.4	-.27
TOTAL	948	5.07	0.65	20.7	3.0	.02

Table 6

MEANS AND STANDARD DEVIATIONS OF CRITERION SCORES FOR
THREE HARD-CORE AND FIVE SUPPLEMENTARY RATING CRITERION SAMPLES

<u>Sample</u>	<u>N</u>	<u>Mean</u>	<u>SD</u>
<u>Hard-core</u>			
Combat Command (Inf and Armor)	433	5.09	0.77
Administrative (Pure Desk Work)	401	5.19	0.70
Technical Hardware (High Level)	149	5.42	0.72
<u>Supplementary</u>			
Artillery Command (FA)	178	5.03	0.80
Combat Staff (3-2 or 3-3)	132	5.09	0.71
Logistics (Supply)	161	5.15	0.73
Logistics (Technical)	174	5.14	0.73
Logistics (General)	120	5.27	0.77

The supplementary samples reflected broader and more inclusive concepts of those areas than did the three hard-core samples. Also, the distinction between technical and administrative areas emphasized the hardware aspect of the technical criterion area, and was not synonymous with the distinction between Technical and Administrative Services as connoted by the Army appellation. For example, the Quartermaster Corps and Transportation Corps are Army Technical Services, but in the present research Quartermaster and Transportation Corps-type activities have been included in the broader (non-hard-core) concept of the administrative area.

Item Data Analysis and Test Revision

Self-Description Measures. -All three self-description instruments were item-analyzed. The Personal Data Record, which is relatively short (55 items) and takes only 30 minutes to administer, was not revised. However, the number of high and low criterion cases in each of the eight

subsamples responding to each option of each item was recorded to provide means for later development of empirical subscores. For both the Combat Self-Description Blank and the Officer Leader Self-Description Blank, each option of each item was biserially correlated with the rating criterion. Item analysis for the COMBIB was conducted in the three hard-core samples and in the artillery command and combat staff supplementary samples. Item analysis of the DOLBIB was conducted in all eight samples. In both instances, the general practice was to retain any item showing appreciable criterion relationship in any sample. By this means, the COMBIB was shortened from 298 to 212 items, the DOLBIB from 480 to 330 items. These measures became the Differential Inventory, Booklets A and B, respectively.

Information Tests. In the case of the information tests, items were biserially correlated with the criterion in all eight samples. For the four tests of specific military information, means, standard deviations, and criterion correlation coefficients in the three hard-core samples were computed for each subscore as established in the preliminary content analysis and also for the remaining items in each test booklet. Sequential test selection was conducted to identify the best three-test combination. Results shown in Table 7 did not reflect particularly high validity. It was therefore decided to select the best 50 items from each specific information test. In the case of the General Information Test, items were selected at large from the 644 items. Any item showing appreciable criterion relationship in any of the eight samples was retained. For the cluster subscores representing subject-matter areas, average item validity biserial coefficients and p-values in the three hard-core samples are shown in Table 8. Results of shortening the information tests by item validity analysis are shown in Tables 9 and 10. The shortened information tests were printed as four 150-item booklets. The first third of each booklet consists of the set of items chosen from one of the specific information tests, and the remaining two-thirds cover general information areas.

Social Perception Measures. Item analysis of the social perception measures (Group Awareness and Individual Understanding) was conducted in the three hard-core samples only, by product-moment correlation of each of the item deviation scores for each item with the criterion in each sample. Item selection across samples resulted in the reduction of the Group Awareness Test from two 75-item forms to one 75-item booklet, and the reduction of the Individual Understanding Test from two 75-item forms to one 75-item booklet.

Command Judgment Test. In the case of the Speeded Practical Judgment Test, which is on moving picture film and requires a special answer sheet, time did not permit any attempt at revision. However, in the three hard-core samples, each option of each item was biserially correlated with the criterion to provide the basis for later development of empirical keys.

Table 7

MEANS, STANDARD DEVIATIONS, AND VALIDITY COEFFICIENTS OF SPECIFIC
INFORMATION TEST SCORES IN THREE HARD-CORE SAMPLES

Test Key	Samples								
	Combat (N-433)			Admin (N-401)			Tech (N-149)		
	M	SD	r	M	SD	r	M	SD	r
<u>Tactics</u>									
Items selected in preliminary analysis (61 items)	39.1	5.3	.17 ^a	37.1	5.2	.11 ^c	37.4	4.9	.09
Remainder (48 items)	24.1	4.2	.12	23.2	4.1	.05	23.8	4.2	.16
<u>Logistics (Technical)</u>									
Items selected in preliminary analysis (63 items)	28.7	7.4	.15 ^c	28.8	8.4	-.07 ^b	35.3	6.6	.05
Remainder (44 items)	16.3	3.5	.09	15.8	3.7	.04	17.2	3.6	-.02 ^c
<u>Logistics (Supply)</u>									
Items selected in preliminary analysis (50 items)	25.9	5.9	.09	26.7	6.0	.12 ^a	27.3	6.0	.14
Remainder (69 items)	27.0	4.6	.03	27.0	4.9	.00	27.6	5.3	.04
<u>Financial Management</u>									
Items selected in preliminary analysis (87 items)	37.4	11.3	-.05 ^b	41.5	13.1	.04	37.3	10.5	.18 ^a
Remainder (35 items)	12.2	2.6	.06	12.0	2.9	.08	11.7	3.0	.08
2-Test Multiple R	-	-	.19	-	-	.17	-	-	.21
3-Test Multiple R	-	-	.21	-	-	.20	-	-	.21

^a First score sequentially selected in its sample.

^b Second score sequentially selected in its sample.

^c Third score sequentially selected in its sample.

Table 8

AVERAGE ITEM-VALIDITY BISERIAL COEFFICIENTS AND P-VALUES FOR GENERAL
INFORMATION REFINED KEYS IN THREE HARD-CORE SAMPLES

Subject Matter Area	No. of Items	Samples					
		Combat		Administrative		Technical	
		Avg r	Avg p	Avg r	Avg p	Avg r	Avg p
rganized Sports	34	.04	.61	.04	.62	.01	.61
ature Sports	14	.05	.60	-.01	.56	.00	.58
arm Facts	23	.04	.54	.02	.52	.01	.55
iology and Medicine	22	-.01	.51	-.01	.49	-.03	.53
Psychology and Psychiatry	10	.00	.41	-.02	.40	-.04	.39
echanical Information	39	.05	.61	-.05	.61	-.03	.71
ysics	21	.06	.56	.04	.56	.01	.77
hemistry	22	.00	.49	.02	.49	-.04	.68
istory and Philosophy of Science	18	-.01	.37	-.01	.36	-.02	.38
athematics	36	.05	.52	.01	.57	.03	.50
ances	15	.02	.53	.00	.53	.04	.58
rt	17	.01	.37	.00	.36	.02	.36
usic	15	-.03	.40	.01	.42	-.02	.44
ntertainment	18	.00	.52	.01	.54	-.03	.53
iterature	26	-.02	.45	.01	.43	.04	.45
orld Affairs and Politics	31	.01	.57	.01	.55	-.02	.55
ocio-Economic Facts	19	.02	.47	.01	.46	-.03	.45
uantitative Miscellany	8	.04	.56	.00	.58	-.02	.62
on-Quantitative Miscellany	13	.02	.62	.04	.65	.01	.62

Table 9

**EFFECT OF SHORTENING THE FOUR SPECIFIC INFORMATION TESTS
BY ITEM-VALIDITY ANALYSIS**

Name of Test	No. of Items		No. of Items		Totals	
	Used in		Not			
	Sel. in Prelim. Anal.	Final Exper. Form	Sel. in Prelim. Anal.	Final Exper. Form	Prelim- inary	Final
Tactics	61	25	48	25	109	50
Logistics (Technical)	63	36	44	14	107	50
Logistics (Supply)	50	28	69	22	119	50
Financial Management	87	42	35	8	122	50
TOTAL	261	131	196	69	457	200

Physical Proficiency Tests. Scores on all six Physical Skills and Stamina Tests were correlated with the criterion in all eight samples as shown in Table 11. The results were disappointing, but in order to retain some measurement in this area, with emphasis on the combat sample, the Two-Hand Coordination, Kneeling Basketball Throw, and Endurance Crawl tests were selected for inclusion in the shortened battery.

**EFFECT OF SHORTENING 19 GENERAL INFORMATION SUBTESTS
BY ITEM-VALIDITY ANALYSIS**

Subject Matter Area	No. of Items		No. of Items		Totals	
	Sel. in Prelim. Anal.	Used in Final Exper. Form	Not Sel. in Prelim. Anal.	Used in Final Exper. Form	Initial	Final
Organized Sports	34	23	12	6	46	29
Nature Sports	14	10	3	5	22	15
Farm Facts	23	13	11	5	34	18
Biology and Medicine	22	13	9	6	31	19
Psychology and Psychiatry	10	10	6	5 ^a	16	15 ^a
Mechanical Information	30	21	11	4	50	25
Physics	21	13	6	4	27	17
Chemistry	22	16	4	0	26	16
History and Philosophy of Science	13	8	20	7	30	15
Mathematics	36	18	16	9	52	27
Games	15	10	7	4	22	14
Art	17	10	9	6	26	16
Music	13	10	11	6	26	16
Entertainment	18	13	3	3	21	16
Literature	26	20	21	12	47	32
World Affairs and Politics	31	12	26	19	57	31
Socio-Economic Facts	19	9	19	13	38	22
Quantitative Miscellany	8	7	13	9	21	16
Non-Quantitative Miscellany	<u>13</u>	<u>9</u>	<u>31</u>	<u>22</u>	<u>44</u>	<u>31</u>
TOTAL	401	231	243	149	644	400

^a Items were added to the Psychology and Psychiatry area from the Socio-Economic Facts area.

* Nov 21

PHYSICAL SKILLS AND STAMINA TESTS (ORIGINAL SET):
VALIDITY COEFFICIENTS AGAINST RATING CRITERION

Sample (N)	Tests in Order of Administration					
	Shuttle Run ^a	Basketball Throw	Vertical Jump	Pull- Ups	Endurance Crawl ^a	Two-Hand Coord
<u>Hard-Core:</u>						
Combat (433)	.00	.10	.05	.03	-.11	.15
Admin (401)	-.06	-.04	.06	.02	-.06	.02
Tech (149)	-.09	-.10	-.03	-.04	.01	.11
<u>Supplementary:</u>						
Artillery (178)	-.02	.06	.01	.04	-.12	-.10
Comb Staff (132)	.00	.09	-.03	.03	-.08	.03
Log (Tech) (174)	.11	-.03	-.12	-.06	.03	.06
Log (Supply) (161)	-.13	.06	.02	.02	.00	.06
Log (Gen) (120)	-.09	.11	.14	.06	-.04	.22

^a Time-score test, such that a low score indicates high performance, and a negative correlation coefficient indicates positive validity.

SECTION II. DEVELOPMENT OF SITUATIONAL CRITERION TESTS

Initial Test Content and Test Summaries

The initial sources for situational test content in all three areas were the MOS descriptions, Technical and Field Manuals, and related publications which had already provided the basis for preliminary grouping of officer jobs and the delineation of three broad job areas. These materials had also guided development of the specific information tests of the predictor battery.

For the technical and administrative areas, outlines of criterion test coverage had been prepared by September 1957. Expansion of situational test ideas into two-page summaries was completed while development of tests in the combat area was still in the exploratory stage. In all, 31 test summaries were prepared for the two areas. By the end of September 1958, APRO personnel had completed review of the 31 technical and administrative test summaries with appropriate Army specialists. Six technical and six administrative tests were chosen for further development.

In the combat area, further guidance was obtained by interviewing combat experienced officers in the Washington area, viewing combat films, and examining combat histories, training films, and Army Training Tests. Also, conferences were held with combat-experienced officers at the Infantry, Armor, Artillery and Missile, and Air Defense Schools. Conferences were also held at the Army War College, Carlisle Barracks, Pennsylvania, at the Combat Developments Experimentation Center, Fort Ord, California, and with OFFTRAIN and MATTRAIN task personnel at the U. S. Army Leadership Human Research Unit, Monterey, California. An overall concept of situational test coverage and a list of potential test ideas were developed for the combat area. At this point (1958), arrangements were made for a specially constituted panel of civilian psychologists to review the research approach to the combat criterion, the overall concept of situational test coverage in the combat area, and the potential test ideas^{3/}.

Since all criterion examinees were to perform all situational tests, ideas for the combat officer tests were based on branch immaterial problems not requiring specialized armor or artillery training. Arrangements

^{3/} The panel consisted of Dr. John C. Flanagan, President and Director of Research, American Institute for Research; Dr. John K. Hemphill, Research Associate, Educational Testing Service; and Dr. Robert L. Thorndike, Chairman, Psychology Department, Teachers College, Columbia University.

were made for review of situational test material of a generalized combat nature at the Infantry School, Fort Benning, Georgia. In October and November 1953, APRO research scientists spent 15 man-weeks with experts of the Ranger Department, Delta Committee, and Platoon Tactics Committee at Fort Benning developing situational test summaries for the combat area. After appropriate revision, eight combat test summaries were identified for further development. The selection was aided by consultation with specialists of the Infantry, Armor, Artillery and Missile School, and from USCONARC, who came to Washington for the purpose.

In all three areas, overall coverage and test summaries were prepared with a view not only to representative military requirements but also toward development of a realistic and meaningful MAAG narrative. In each broad area a tabulation was prepared showing the military-psychological factors to be measured by each test. (Figure 10).

Draft Scenarios of Test Action

To expand the test summaries into scenarios specifying the sequence of test action and to establish the precise aspect of the action to be scored, APRO research psychologists had to work jointly with Army subject-matter experts. During the first half of 1959, APRO personnel visited the following schools to develop the action for the technical and administrative tests: The Engineer School at Fort Belvoir, The Adjutant General School at Fort Benjamin Harrison, The Quartermaster School at Fort Lee, The Transportation School at Fort Eustis, and The Signal School at Fort Monmouth. In addition, further scenario development for one set of tests linked by the story line of the MAAG narrative was conducted in Washington in consultation with Engineer, Quartermaster, and Transportation Corps experts. Through DCSPER coordination, a field-grade combat officer was designated to work with USAPRO personnel in expanding the combat officer test summaries into draft scenarios and in identifying points to be scored.

The draft scenarios were given trial administration before being put into test manual form, in order to check on feasibility of administration, naturalness of dialogue, realism, military meaningfulness, observability, and practicability for scoring purposes. During this phase, further development and revisions in scenarios and score sheets were accomplished. For the technical and administrative tests, task personnel conducted the developmental trials in collaboration with appropriate subject-matter specialists, primarily at the Quartermaster, Signal, and Transportation Schools. By coordination with USCONARC, all developmental field work on the combat officer test problems was done at Fort George G. Meade, Maryland. A full-time project officer and an enlisted team of the Third Armored Cavalry Regiment worked jointly with APRO personnel in field development and revision of the combat scenarios.

BEHAVIORS

TEST	PERCEIVING Situa- tional Elements	JUDGING Future Developments	ANALYZING Problem Elements	PLANNING Future Action	ORGANIZING Resources	DECIDING Course of Immediate Action	TAKING INITIATIVE to Act	COMMUNICATING Orders and Info	TRAINING Sub- ordinates	DIRECTING Sub- ordinates	PERSISTING Under Stress
TECHNICAL											
Evaluation	✓		✓					✓			
Exhibit	✓		✓				✓			✓	
Inspection	✓		✓				✓			✓	
Layout			✓		✓						
Survey						✓		✓	✓	✓	✓
ADMINISTRATIVE											
Analysis			✓		✓			✓			
Facility				✓			✓				✓
Location			✓	✓			✓	✓			✓
Management	✓		✓		✓						
Records	✓		✓					✓			✓
COMBAT											
Defense		✓		✓	✓	✓				✓	
Interdiction		✓		✓					✓	✓	
Movement		✓		✓							
Penetration	✓					✓		✓		✓	✓
Surveillance	✓					✓		✓			

Figure 10. Military-psychological behaviors in situational criterion performance tests.

When in mid-1959 DCSPER determined there was no possibility of establishing one or more officer evaluation centers with sufficient personnel to administer a five-day situational criterion, the six technical, six administrative, and eight combat test problems were further reduced to three technical (one very elaborate), four administrative, and five combat tests. During 1959 and 1960, the Task's main effort was the expansion of these twelve situational test scenarios into full test presentation. Work began on the preparation of manuals for the twelve tests. To provide flexibility for possible later use, each situational test manual was so constructed that the performance test could be administered either by itself or jointly with other tests in a total narrative framework.

For each test, the basic scenarios, scoring instruments, and other supplemental materials were organized into standard manual format with structure as typified in Table 12. As each manual was completed, it was forwarded for quantity reproduction with the intention that printed manuals be taken to the appropriate branch schools for critical review and indorsement by subject-matter experts of the school faculty.

Review and Field Tryout

Review at Branch Schools. By arrangement with USCOMARC, all situational test manuals were reviewed and tried out at the cognizant Branch Schools: The Quartermaster School (Fort Lee); The Adjutant General's School (Fort Benjamin Harrison); The Transportation School (Fort Eustis); The Signal School (Fort Monmouth); The Engineer School (Fort Belvoir); and The Infantry School (Fort Benning).

At each school, faculty experts reviewed test content from the point of view of military meaningfulness and technical accuracy, checked the scoring and relative weights where pertinent, collaborated with APRO research scientists in making needed revisions, and gave their indorsement to the revised manuals. Each test was then administered to six lieutenants, some with relevant experience and some without, for further verification of feasibility and adequacy of instructions, and for the experience gained in training personnel to administer the tests. All five combat officer tests were reviewed and tried out in this manner at the Infantry School, Fort Benning, Georgia.

Tryout at the OEC. When the Officer Evaluation Center was established at Fort McClellan, Alabama, and the first few officers of its staff had reported in, the work of tryout and modification continued at the new location. After seeing the total structure of the situational tests in operation for the first time, research personnel decided that there were insufficient measures in the technical area. Further, one test designated technical was found not to have substantive technical content, and it was redesignated an administrative test. Therefore, beginning in January 1963, a crash program to develop three more technical tests was undertaken.

Table 12

TYPICAL STRUCTURE OF SITUATIONAL TEST MANUAL

<u>Contents</u>	<u>Number of Pages</u>
PREFACE	1
(Provides over-all MAAG setting and the immediate narrative situation in which the particular test problem occurs.)	
I. OVERVIEW	2
Purpose Summary of Test Action Summary of Scores Obtained Summary of Personnel and Time Requirements	
II. AREA AND EQUIPMENT REQUIREMENTS	4
General Physical Layout Equipment	
III. TEST SCHEDULE	4
Preparation for Testing Action Sequence (Detailed time chart)	
IV. INSTRUCTIONS TO EXAMINERS	15
Over-All Approach Roles of the Examiners Administration of the Problem (<u>ACTUAL SCENARIO</u>)	
V. RECORDING AND SCORING THE EXAMINEE'S PERFORMANCE	11
(Detailed instructions for each scoring document)	
VI. APPENDIXES	15
(Checklists, maps, messages, and similar requirements used by examinees or examiners)	
TOTAL PAGES	52

The experience of Task personnel in developing the twelve original tests permitted some shortcuts in this new effort, although contact was maintained with the cognizant schools and with other subject-matter experts. Manuals were assembled following the already established pattern, and dry-run trials were conducted at the OEC itself. By the end of June 1963, all measures were operating in final form at the Center.

After the OEC staff had reached full strength and had become proficient in administering the situational measures (first singly, and then as an integrated exercise), pilot groups of locally obtained lieutenants were tested. The period of shakedown operation continued through June 1963. Detailed refinements in individual tests and the overall MAAG narrative were worked out.

In final form, the Differential Officer Performance Battery consists of 15 situational tests--five technical, five administrative, and five combat. Figure 10 shows the general structure of military-psychological measurement in the total exercise.

SECTION III. PLANNED STATISTICAL PROCESSING AND ANALYSIS

Officer Prediction Task efforts are projected to include continued collection of predictor data into 1964, administration of the situational criterion test exercise at the OEC through June 1965, additional analysis of predictors in both the 1958-1959 and the 1961-1962 ratee samples, processing of both predictor and criterion data, organization of the data for analysis, and differential validity analysis.

Predictor Data

Three kinds of predictor data are expected to be ready for differential validity analysis by July 1964, a probable first cut-off date for situational criterion data collection at the OEC:

Job-oriented DOB Subscores. Scores on sets of DOB items were identified in the 1958-1959 ratee sample on the basis of relationship to rated performance in the hard-core technical, administrative, and combat subsamples. Scoring formulas, or keys, for these groups of items will be validated first against ratee criterion data obtained on technical, administrative, and combat officers in the 1961-1962 sample, and finally against the situational performance criteria in the OEC job area subsamples.

The Subject-Matter Item Clusters. Clusters of items in the self-description and information (interest) instruments are being delineated by subject-matter on a judgmental basis. These clusters will then be refined empirically by internal analysis using cases in the 1961-1962 sample. This phase will involve identification of suitable samples for

analysis, and the iteration of item-subscore correlation analysis for empirical refinement of the item clusters. Scores on the refined keys will then be obtained for all DOB examinees. (Data are available for hypothesizing the most valid clusters for the various job areas, based on results in the 1958-1959 ratee sample. Thus unbiased validity estimates for these clusters can be obtained in the 1961-1962 sample.) Empirically defined predictors which are psychologically meaningful are desirable for use by students and incoming officers for self-analysis and for counselling, as well as for operational guidance in branch and duty assignment.

Operational Data. One element in the evaluation of the experimental predictors will be the possible improvement they offer over measures currently used in the various selection programs through which the Army procures its officers. For two-year reservists, operational data used in selection and branch assignment include score on the ROTC Qualifying Examination, college major, college grade-point average, and stated preference for branch assignment. Available data of a comparable nature will be processed for Regular Army officers entering service as ROTC Distinguished Military Graduates or as U. S. Military Academy graduates.

Preliminary Analysis of Criterion Data

Job descriptions and job performance ratings are obtained on all officers in the examinee samples. The ratings provide one criterion on all predictor examinees. On the basis of job descriptions, homogeneous subsamples will be established corresponding to those analyzed in the 1958-1959 sample. Criterion rating scores computed on these officers will permit validation of job-oriented scoring keys established in the earlier sample. Within any subsample, those officers selected for OEC criterion testing will constitute a special subsample for comparison of rating and situational criterion.

Situational performance test data from the 15 tests of the DOPB will be subjected to correlational analysis to evaluate the internal consistency of the 15 problems and of scores in the three broad areas--technical, administrative, and combat. These data will be examined separately in each of the three 300-officer samples in order to determine the effect of type of Army duties on level and correlational behavior of scores. The outcome will guide considerations of whether subsequent validity analysis must be conducted separately in each of the three samples or can be based on the combined 900-officer sample with three main criterion scores for each case.

Similar analysis by job-area sample will also be conducted on the auxiliary criterion data reflecting branch and job satisfaction and career intention of the OEC examinee. In addition, the actual retention criterion will become available for these examinees as their terms of obligated service expire.

Validity Analysis

The primary focus will be on the tests of the minimum hypothesis in the OEC sample. Each of the 900 situational criterion cases will have three performance scores reflecting technical, administrative, and combat performance. If the technical predictor is more valid for technical performance than are the administrative and combat predictors and if it is more valid for technical performance than it is for administrative and combat performance--and if similar results are attained with the other two predictors--then the minimum hypothesis is upheld and abilities to meet the differing psychological requirements of the three kinds of officer jobs are differentially predictable.

Also in the OEC sample, the validity of the predictors will be examined against the auxiliary criterion measures of branch and job satisfaction and strength of career intention to determine whether means exist for placing newly commissioned officers in branch and job assignments which will enhance their feelings of satisfaction and their disposition to become career officers. Finally, the interrelationships among the situational criterion scores, the auxiliary criteria, and the job performance rating will be examined.

In the larger group having the rating criterion, the three types of predictor (job-oriented DOB subscores, subject-matter DOB subscores, and operational data) will be validated by similar differential analysis. For this study the sample will be broken down into eight subgroups matching those analyzed in the 1953-1959 examinee sample. Since these subsamples represent a more refined breakout of officer jobs than do the three broad areas of technical, administrative, and combat jobs, a favorable outcome in these groups could permit the selection of predictor content for operational use over a fairly wide range of officer job types.

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